LIGHT RAILWAYS

Number 105 July 1989

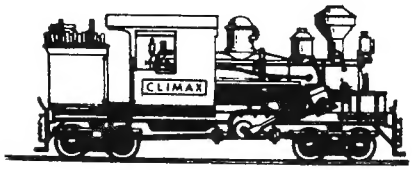
The North Mount Lyell Railway, Tasmania. Part 1: Construction

Cornwall Coal Mine Electric Locos, Tasmania

ISSN 0 727 8101

The Light Railway Research Society of Australia Inc.

Registered by Australia post — publication No. VBQ1339



No. 105
Vol. XXVI
JULY 1989

ISSN 0 727 8101

Light Railway Research Society of Australia Inc.

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CONTENTS:

EDITORIAL

The West Coast of Tasmania has long held a fascination to railway and mining historians due to its wealth of 'little railways' serving the mines of the region. The North Mount Lyell Railway was built to a grander scale than other lines in the area and its history offers a fascinating insight into human strengths and failings. In this issue we commence a detailed three part history of the North Lyell railway and the mining field it served.

Ray Ellis has prepared a well researched history which brings to life the hardship of exploiting minerals on the West Coast and the importance of railways to the communities of the mining field in the Linda Valley. The first serving covers the discovery of the field, the formation of the North Mount Lyell Company, and the planning and construction of James Crotty's grand railway. The second article will cover the operation of the railway and its decline, while the final offering covers the locomotives and rolling stock which served the railway. I trust you enjoy the story.

ERRATUM

Fraser Island was incorrectly spelt on the cover of *LR.104.*

Cover: A NA-class locomotive shows its distaste as D.21, an 0-6-0DM locomotive ex-TGR (their V.12), tries out its regauged wheels on PBPS metals at Belgrave on 30 December, 1987.

Photo Peter Jzilezck, courtesy Ray Graf

THE NORTH MOUNT LYELL RAILWAY, TASMANIA PART 1: CONSTRUCTION

by Ray Ellis

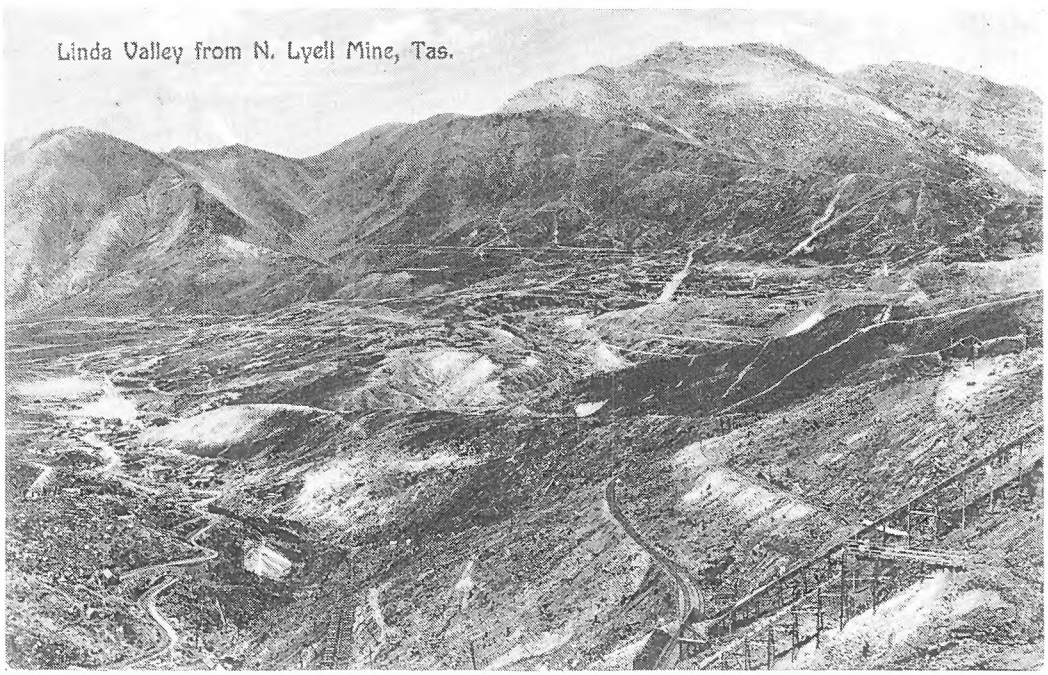
Introduction

Towering majestically over the forests and swampy button grass plains of Tasmania's West Coast are the black mountain ranges, topped by peaks of white quartzite or pink conglomerate rock which strongly resembles the Alpine heights of places like Switzerland and Austria. Through these mountains the rivers cut like a knife — swift flowing and often in deep valleys. The weather is markedly varied, not only from day to day, but also from season to season. It is an area of heavy rainfall, one of the highest in Australia, and the cold, chilly winters often bring snow, particularly on the higher parts.

It was into this environment that the early explorers made their way, to be followed later by others in search of minerals which led to the development of one of the richest mining fields in the world. The area did not yield its wealth easily and the history of its development is one of hardship and struggle. Given the terrain and climate, railways were to play an important part in this development and rather uniquely they were, in many cases, the preferred alternative to road transport.

The Discovery of Mount Lyell

Mount Lyell was 'discovered' for the European world by Charles Gould who, making his second trip into the area with a party of miners and bushmen, was on a Government expedition to the west coast in search of gold following the rush for the mineral on the mainland of Australia. Other explorers had preceded Gould and had probably



Linda Valley from the North Lyell mine, West Coast from an old postcard courtesy Frank Stamford

seen the peak which he was later to name. Gould on this trip was travelling up the King River and attempted to cross the West Coast range at Comstock Gap, but being unsuccessful moved a mile south. It was here, on 16 February 1862, that he entered what we now know as the Linda Valley. Gould named the valley Chamouni and the stream that flowed into it Linda, possibly after the new opera composed by Donizetti, *Linda di Chamounix.* Chamonix was a famous French glacial valley, very similar to the Linda Valley. At this time Gould also named Mt Darwin, after the famous scientist, while Mts Lyell and Huxley were named after Darwin's assistants, and Mts Sedgwick, Owen and Jukes after opponents of Darwin's theory of evolution.

Gould failed to find gold, but it would seem possible that he did find traces of copper, as it is recorded that he did so in 1862 and the Linda Valley was the only known copper-bearing country transversed during that expedition. Gold was later found in the district and it was this discovery which led to the early development of the Mt Lyell mining field.

An early West Coast prospector HW Judd photo

Early Development of the Mt Lyell Field

From the 1880s, the Mt Lyell field was worked for gold, but estimates of the gold-bearing bodies proved to be inaccurate. One of the early diggers was an Irishman named named James Crotty, who played an important role in the early development of the field, and was later to play an even more important part in its emergence as a copper field.

The early gold miners formed themselves firstly into a prospecting association to investigate and work the field and later, in 1888, into the Mt Lyell Gold Mining Company NL. The mining company consultant first drew the attention of the miners to the presence of copper, but at this stage it was considered of insufficient quantity to warrant mining.

By 1891, interest in gold had waned, but a group of Broken Hill speculators expressed an interest in the Mt Lyell mine and had ore samples analysed. The ore that interested them most was that which contained the previously overlooked copper. The group kept their findings to themselves and went quietly about buying a controlling interest in Crotty's company. In January 1892, the Broken Hill men formed the Mt Lyell Mining Company and when the copper discovery was made public, shares in the company increased appreciably in value. One of the leaders of the Broken Hill group was another Irishman, Bowes Kelly, and it was this man and his company who were to become the bitter enemies and arch rivals of Crotty.

James Crotty retained his interest in the Mt Lyell Company. In 1892, he and Bowes Kelly had the first of many arguments. It revolved around Kelly's refusal to allow a trial survey of a railway along the gently sloping country between the Mt Lyell field and Kelly Basin, on the shore of Macquarie Harbour. The quarrel between the Irishmen was to become the costliest feud in Australian mining history.

In the meantime, Crotty had been consolidating his interests in the Mt Lyell field and floated many of his small leases into small copper mining companies in the late 1880s and 1890s. As the field developed, Crotty gradually sold his interests in the small companies, paid his debts and became a very rich man. However, he retained his interest in a lease at North Mount Lyell and it was this which was to prove of greatest benefit in his battle with Bowes Kelly.

In the mid-1890s, the Mt Lyell Company went through a bad time with share dealing and issue of debentures, not helped by Crotty who publically criticised the way the company was run. The company appreciated the necessity of a railway, but predictably did not follow Crotty's advice as to the route it should follow. The company obtained Government approval to build its railway in December 1892 (amended in October 1893) and, in March 1893, it was reformed as the Mt Lyell Mining and Railway Company. The purposes of this was to raise the necessary finance to build a railway from Queenstown, centre of the mining field, to the coast via the King River route, which lay to the north of Crotty's original proposal.

The North Mt Lyell Company

James Crotty was making little headway with his ideas on the local scene, which annoyed him immensely and fueled his hatred of the Mt Lyell Company and its leaders. Hoping for better luck elsewhere, he set sail for England in early 1897, where he planned to raise sufficient finances from rich British investors to build his own railway and copper smelter. His interests on the Lyell field were left in the trusted hands of his friends who continued the vendetta against the Mt Lyell Company. Despite the fact that much of the information given to prospective British investors was grossly overstated or incorrect, Crotty was successful in getting the support he desired, and the North Mount Lyell Copper Company was registered in London in September 1897. It aimed to acquire and work the North My Lyell mine and erect a railway, wharf and smelters. Shares in the new company sold well, despite their speculative nature. Within a month, the company's fortunes took a dramatic turnaround, and by no less than a party of roadmakers!

The North Mt Lyell mine stood on a ridge high above the Queen River valley and could only be reached by a hazardous journey, first by dray, then pack horse. The mine owners pressed for a road of sorts to be built to the area and eventually the government agreed. On 20 October 1897, a gang of roadmakers fired explosives to clear a crop of quartzite. When the air had cleared, the workers found a glittering blue and purple mineral imbedded in the quartz. It turned out to be bornite, one of the richest copper ores. The news spread quickly and the company began to explore the new outcrop. The roadmakers had discovered what was to become the richest mine in Tasmania and would yield three times as much copper as the famous Iron Blow mine of the Mt Lyell Company. Crotty and his company had fallen on their feet and their shares rocketed in price.

Early Problems

Following the successful launching of his company in England, Crotty vigorously pressed ahead with his plans to develop the mine, build a railway and smelters, and thus dominate the west coast copper field. However, things did not go according to plan. On 16 April, 1898, James Crotty died in London, aged 54. The North Mt Lyell Company wavered after his death, for he had been its life and soul. His impact is probably best described by Geoffrey Blainey in his book, *The Peaks of Lyell:*

> Crotty, the prospector who became a mining magnate, was almost a unique figure in Australian mining. What is more he wrested his fortune from adversity enough to crush nine out of ten stout hearts. He had faith, perseverance, mining knowledge, and cunning, that rare mixture of qualities which, spiced with luck, brings mining success. Unlike many bushmen he did not shudder at the sight of a cable tram or a crowded street. He was equally at ease cooking bacon on a camp-fire or mingling with silk hats and frock-coats in fashionable London hotels. He could sink a shaft or write a prospectus with the same skill and energy. (p.125)

Although skilled in their own particular fields, the North Mt Lyell directors in London had little knowledge of Australian mining conditions and knew even less of the domain which they now had to govern from afar. Their orders were executed through an advisory board in Melbourne, of whom the most important members were JP Lonergan, the chairman, and JP Madden, secretary.

Regretably the directors in London could not see their way clear to spare the time to come to Tasmania and directed operations through a miriad of cable-grams, the cost of which, with their fees and administration, ran up a bill of proportions which the company, still in its infancy, could ill afford. Moreover, bitter resentment built up between the Australian and London boards. Without Crotty's powerful guiding hand, an air of irresponsibility quickly enveloped the boards on both sides of the world: money was spent lavishly and with little thought for its consequences.

Transport Arteries

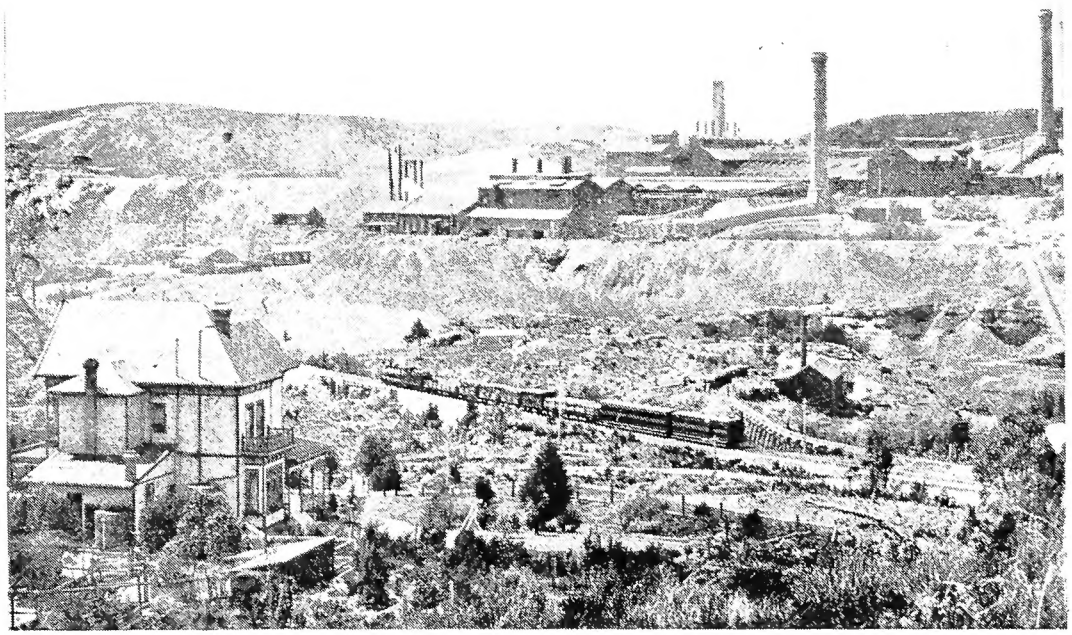
In the early days the only way to the Lyell field was by foot or sea. The foot-sloggers first made their way to Waratah, then walked down the west coast to Strahan and struggled up into the mountains and the field. The overland track from the

east, which came into use in the 1890s, was only used as a last resort.

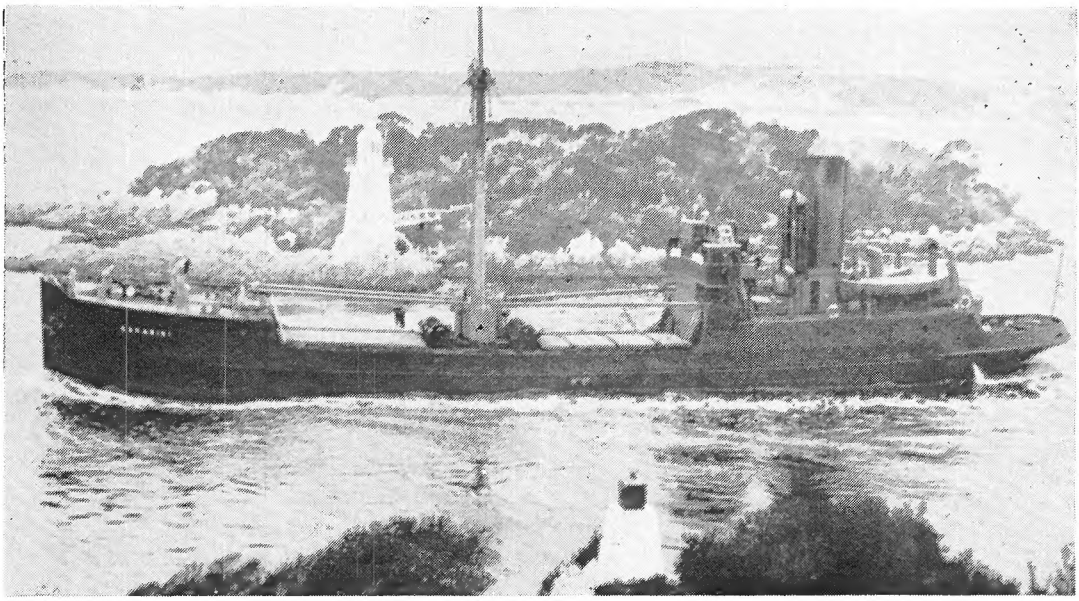
Ships made the difficult passage through the entrance to Macquarie Harbour and across the bay the Strahan, from where goods and passengers were ferried for a short distance up the King River, before making the rest of the journey by pack-horse or foot. The narrow, shallow entrance to Macquarie Harbour soon earned the name 'Hells Gates'. Only small vessels could make the entry and even then, waiting for suitable weather conditions to cross the bar was common. This led to high freight and insurance costs, so alternative, particularly railways, were eagerly sought.

Hobart, Launceston and Burnie were all interested in the west coast trade and the government authorised various railways surveys from these places to the silver mining town of Zeehan. A depression in the mining industry in the 1880s cooled these plans, but the copper boom of the 1890s generated renewed interest. There were many railways and tramways planned during this boom, their promoters no doubt spurred on by the success of the Silverton Tramway serving the Broken Hill mines. Many never got beyond the planning stage, fewer still even got to parliamentary authorisation, but some did come to fruitition and form part of the network of lines which served the mining industry on the west coast, including Mt Lyell.

The main railway line to Mt Lyell, which developed in the 1890s and early 1900s, was a rather strange affair in that, although it had a common gauge of 3 ft 6 in (1067 mm), was worked in sections in the main, due to its different owners. The first section to open was the Government railway from Strahan to Zeehan in February 1892. This was followed by the first section of the Mt Lyell railway from Teepookana (on the King River) to Queenstown, completed in July 1896, but not officially opened until March the following year. Further north, the Emu Bay Railway Company leased the Emu Bay & Mt Bischoff Railway from Burnie to Waratah (which had its origins in a wooden railed tramway) in 1897, but did not exercise its option to purchase this section until 1924. From a junction of this line at Guildford, the EBR extended the line south to Rosebury in 1899 and onto Zeehan



A TGR mixed train passes Zeehan smelters at the turn of the century HW Judd photo



A steamer makes its way through 'Hells Gates' at the entrance to Macquarie Harbour.
Photo: Geoffrey Blainey — The Peaks of Lyell Melbourne University Press

in 1900, where a connection was made with the Government line to Strahan. The Mt Lyell Company extended its line from Teepookana to the harbour at regatta Point in November 1899, but it was not until october 1900 that the short connection round the harbour to Strahan was opened to complete the through rail route.

Shipping

Although there was a rail connection to the rest of Tasmania by 1900, shipping still played an important role in the development of the west coast. The mining field maintained a close connection with the mainland, particularly Melbourne, where many of the companies had their registered head offices. As a result, two shipping traded developed: one the the mainland, sometimes via northern Tasmanian ports, and the other to Hobart via the southern route around South West Cape. The formation of the Strahan Marine Board in 1897 led to the opening out of 'Hell's Gate', enabling larger vessels to enter the harbour by 1900.

Shipping to Macquarie Harbour on what could be termed a regular basis, began in the early 1890s. Soon a number of shipping companies were competing for the trade to the west coast. TA Reynolds, Risby Bros, Huddart Parker, the United Steamship Company and the Tasmanian Steamship Company all had interest in the trade. In 1895, a most unlikely contender entered the field, the Union Steamship Company of New Zealand. They soon gained the upper hand, in some cases by purchasing the smaller companies, and from 1900 the Union Steamships Coy was firmly established in both the Tasmanian coastal services and the run to the mainland, particularly Melbourne. They maintained their position of control for some 70 years until, for economic reasons, they withdrew from the west coast trade in 1970.

Among Crotty's bold plans to develop his mining interests was a means of overcoming the difficult harbour entrance. In 1897 he placed an order with Armstrong, Whitworth & Coy of Newcastle-upon-Tyne in England for a specially designed shallow draft ship which would be capable of making the difficult harbour entrance, travel at high speed, and yet have a respectable cargo and passenger accommodation. Launched in December 1898, and named the ss *North Lyell*, the vessel was 300 ft long, had a gross registered tonnage of 2027 tons, and was licenced to carry 100 saloon (1st) and 73 second class passengers in spacious accommodation. This attractive vessel was three times larger than any other ship to enter the harbour, but its shallow draft only allowed a cargo capacity of 800 tons and, as a result, it was not conducive to good behaviour on the seaway. The cost to Crotty and his company for this unrestricted entry to the harbour was £60,000.

The ss *North Lyell* was destined to make only one voyage under the North Mt Lyell flag. The Union Steamship Coy, anxious that the vessel would be a competitor to its own vessels, purchased the ship for its building cost and in return guaranteed to provide the North Mt Lyell company with all its shipping needs. Renamed the ss *Moura* by its new owners, the vessel was an uneasy addition to their fleet and was moved from trade to trade which took it all over the Pacific. It was not finally broken up until 1956 after an unspectacular career, extending over half a century under no less than four owners.

Railway Plans

As the Mt Lyell field started to boom, two company surveyors from Victoria, WF Egan and W McEachern, made a trial survey for a railway from the Linda Valley to Kelly Basin. In August 1897, Crotty announced that his proposed company would build a 30 mile (48 km) long 2 ft 6 in (762 mm) gauge railway between the two points. No doubt the choice of gauge was influenced by much publicity in railway circles at this time for the adoption of this gauge as most suitable for light railways in developing countries. This argument was reinforced by the British Army's choice of this gauge in 1897 for its tactical light railways in the colonies.

However, when Crotty and his advisers heard of the rich copper lode discovery on their lease in October 1897, they abandoned the narrow gauge proposal and drew up ambitious plans for a 3 ft 6 in (1067 mm) gauge railway which, running on easier grades, would be far cheaper to operate than the rival Mt Lyell railway. It was pointed out that the North Mt Lyell railway would run past the foot of the newly discovered copper fields at Mts Jukes and Darwin, as well as serving every mine in the Lyell field!

There was no doubt that the proposed North Mt Lyell railway, by reason of its geographic location, would have a decided advantage over its rival, but Crotty wanted to leave nothing to chance and, in typical fashion for railway promotions of the time, launched into a bitter attack against the Mt Lyell railway. Some of the claims made by him and his spokesmen were somewhat exaggerated, and a map produced at the time showed the North Mt Lyell railway curving around from Gormanston, past the bottom of the Mt Lyell mine, straight up and down two vertical cliffs, and up a steep gully to the North Mt Lyell mine!

Crotty obtained financial support to build his railway, despite these outlandish claims, probably because most of his supporters were totally ignorant of the area. In the event, the railway as built, whilst adequate in itself, would prove to be a financial disaster which would contribute to the downfall of the company and regretably did not meet some of its most important objectives, or become a real competitor to the Mt Lyell railway.

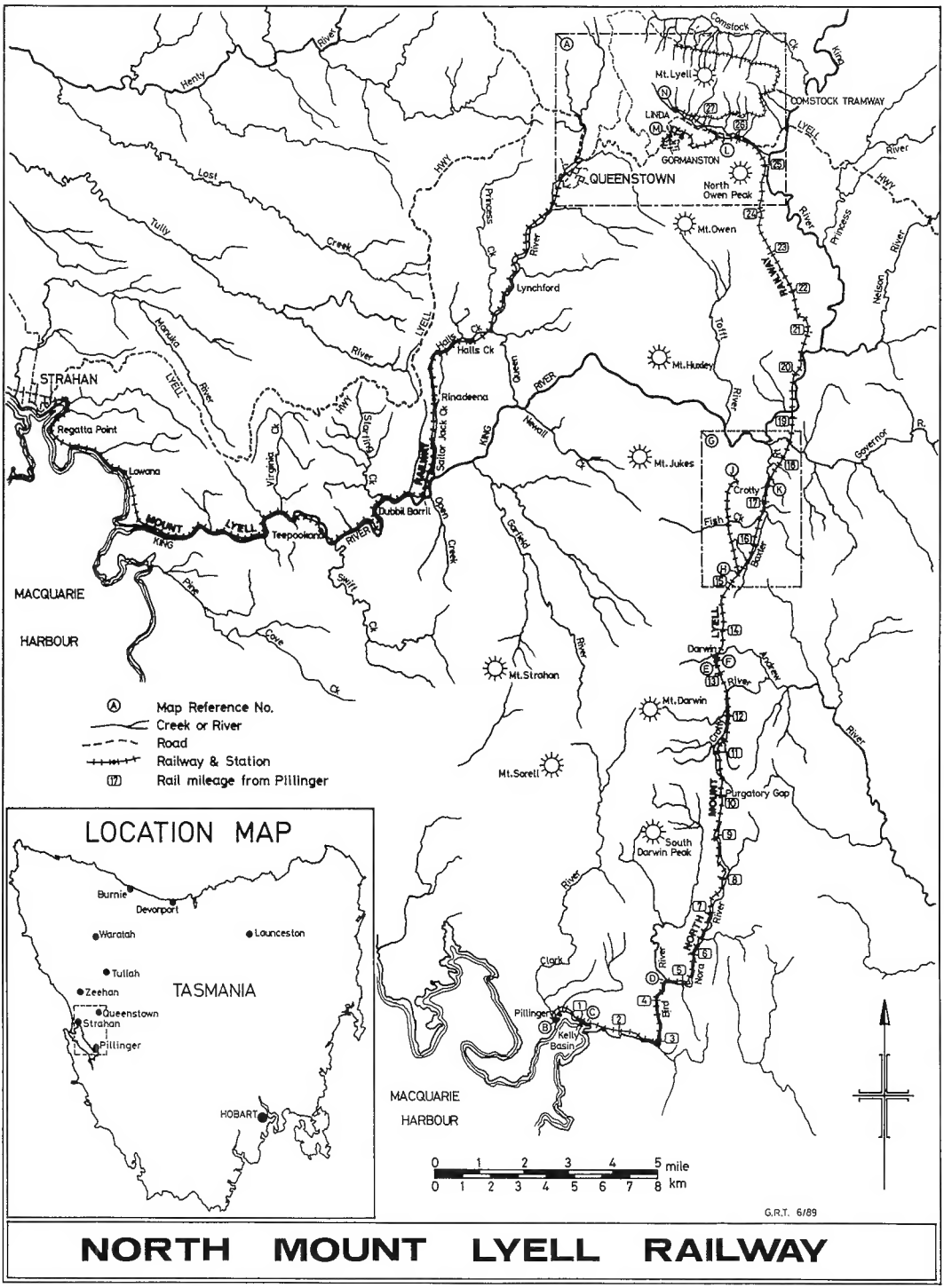
The Tasmanian Parliament passed The North Mt Lyell and Macquarie Harbour Railway Act on 24 December 1897, giving the company the necessary approval to build, maintain and work a railway with a gauge of 2 ft or more. Whilst the Act specified the maximum grade to be no more than 1 in 30, interestingly it also permitted the company to use the Abt rack system or Fell system if it wished to traverse steeper grades. This seemed incongruous after the company had been critical of the Mt Lyell railway's use of the Abt system.

Railway Survey

In March 1898, survey work commenced on the proposed railway with five survey teams working at six mile intervals over the 30 mile (48 km) length of the line. Supervision of these teams was handled by three men. The lower or Kelly Basin section was under the care of Mr MF Egan, who was also in overall charge of the whole survey. The middle, or King River section, was under Mr Power, and the upper, or Linda Valley section, was in the care of Mr W McEachern. The company also appointed Mr A Clayton as their Engineer in Chief and Mr G Cook as Superintending Engineer, to handle the construction of the railway.

Plans indicate that the railway was to run from wharfage easements on Kelly Basin across the Fysh River, along the foreshores of the bay for a mile, before running inland across alluvial flats to the Byrd River on a 1 in 200 grade. The line, now on a 1 in 45 grade, was to follow the Bird River up through 'Toe Nail Gorge', tunnel through the Razor Back just beyond the three mile, to cross the Byrd where it joined the Nora River. It was then to follow the latter stream until the 8 mile, where it was to leave the Nora River and follow Purgatory Creek to its source at a gap 10 miles (16 km) from Kelly Basin. proposed grades steepened to 1 in 40 in this section.

After tunneling through the gap at 900 feet (275 metres) above sea level, the line was to descend for about 3 miles (5 km) to the valleys of the Crotty and Andrews Rivers. It then climbed again for about a mile to the button grass plains east of Mt Jukes, crossing five miles of almost treeless plain on practically level track. From here the railway would cross the Governor and King Rivers within a mile of each other before ascending on a 1 in 45 grade along the foothills of the Thureau Hills and



NORTH MOUNT LYELL RAILWAY

Mt Owen, around the eastern spur of Mt Owen and into the Linda Valley. The terminus was on a flat, one mile east of and 500 feet (150m) below the company's mine. Provision was made for a branch diverging from the main line below Gormanston Cemetery, just after entering Linda Valley.

General features of the country to be transversed were the alluvial plain for the first four miles (6km), schist and freestone on the hills, and peat on the button grass flats. The peat was to a depth of 15 inches (38 cm), but beneath this was quartz gravel which was considered to be ideal for ballast.

Railway Construction

Prior to letting the main contract for construction of the railway, a contract for clearing the first five miles and construction of the formation was let to Sweeney Bros and Reynolds, Gaffney & Callaghan respectively. Just what prompted the company to take this action is somewhat unclear, as about this time tenders for construction of a line 31 miles 41 chains (50 km) long, from the new town of Macquarie on Kelly Basin to the Linda Valley, were called, and were to be in the hands of the company by 29 August 1898.

At Kelly Basin, Duff Bros had gained the contract for construction of the company's wharves and, by January 1899, they had built a 800 ft (240m) long jetty on the eastern leg of the bay, a 400 ft (120m) wharf at Kelly Basin and had almost completed a 400 ft pier at the same location. The pier was completed and the first locomotive ran on it in May 1899.

A contract with well known Australian railway contractors, Baxter & Sadler, was signed on 18 November 1898, which quoted a price of £5,252 per mile to cover earthworks, forming the roadbed, construction of all bridges and culverts, providing all sleepers, laying the permanent way and ballasting. The rails and fittings were to be supplied by the company and delivered to the contractors at Kelly Basin. It was anticipated that the work would be sufficiently advanced in 12 months to allow the passage of ore trains. There appears to have been some controversy over the appointment of Baxter & Sadler and thereafter there were reports of collusion between the company and the contractors in their gaining the contract.

Newspapers carried advertisements for navvies, who poured into Kelly Basin to work on the construction. Earthworks for the line were commenced

Kelly Basin in 1898 showing early construction works on the northern side of the Basin. The 800 ft brickworks' jetty can be seen to the right. Tasmanian State Archives

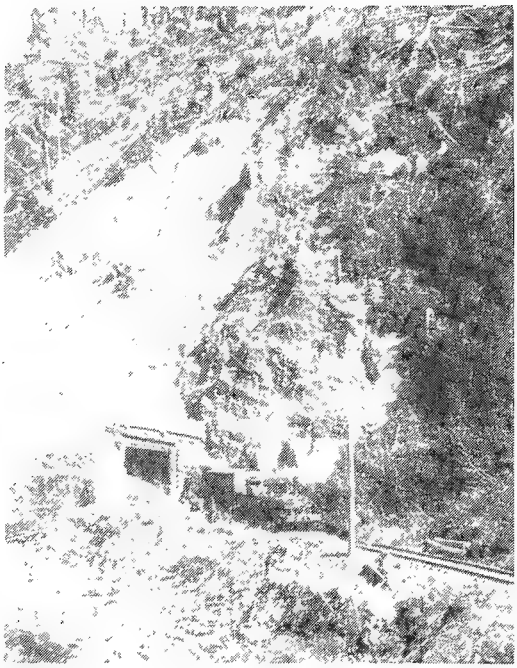
in the latter half of December 1898, and by early in the new year the formation had reached the 4 mile peg. Ahead of this was the formation clearing which had been sub-contracted to Mr J Kelly. By early February 1899, the formation had cleared the 8 mile, cuttings and embankments were complete to the 5 mile and the line nearly complete to the 3 mile. Once the Fysh River bridge had been completed, it was expected that platelaying would go ahead to 3m 20c.

At this time the contractors were employing some 450 men, but by April 1899, a total of 900 men were working in the area: 600 navvies on the line, 150 on various other company projects and 150 men in other areas of the railway's construction. It was at this time that Mr A Baxter, one of the partners of the contractors, arrived to check progress and decided to stay in a supervisory capacity.

In the winter of 1899, landslips caused serious problems and hampered cons-truction work. However, by November, the earthworks and formation were complete almost to Linda and platelaying had been completed to the 10 mile. Difficulty had been experienced with the tunneling of the Razor Back at 3m 30c, and all through late 1899 and early 1900, there was heavy rain, with resultant landslips which continued to hamper progress.

There has been much discussion recently about the alleged existence of two tunnels on the railway. After studying of records and files, the conclusion was reached by some that no such tunnels existed and that timber retaining walls had been used to prevent landslips. This seemed to be supported by official reports of the line at the time of merger with the Mt Lyell Company in 1903. However, the recent publication in *Light Railways* (No. 80) of a photo showing a locomotive (which did not arrive on the line until after 1903) posed at a tunnel mouth, and the discovery of blueprints for two tunnels, appears to confirm the existence of the tunnels. The first of these was at the 3 mile, where a 156 ft tunnel was built, and the blueprints confirm it was identical with the tunnel shown on p.15 of *LR.80*. The second was a tunnel of 243 ft length at the 10 mile, but there is considerable doubt as to whether this was completed, although there is a report of this tunnel being abandoned in June 1899 and substituted by a cutting.

Both tunnels were to be timber lined. Whilst the method was not unknown in tunnel construction, it seems unusual for a railway for which no expense was spared in its construction, and brick or concrete would have been more appropriate. Timber was used extensively in retaining walls on the railway, and one would be forgiven for considering the shallow 'tunnel' at 3 mile as more of a landslip shelter than a tunnel.



Photograph of North Mt Lyell tunnel through the Razor Back at 3 mile. The locomotive has been identified as *MALVOLIO,* a Sharp Stewart product (2030/1870) built for the Mersey & Deloraine Railway and converted at Launceston Workshops to 3ft 6in gauge and 0-6-0ST wheel arrangement. It was purchased by the Mt Lyell Company in 1896 and transferred to the North Mt Lyell railway in 1903.

Colln Mrs M Goodwin, courtesy R Morgan

Early in 1900 a construction train crossed the Governor River, but work was still progressing on the crossing of the King River. A temporary suspension bridge was erected over the latter stream to allow construction to continue and, by mid-May, platelaying had reached a point 2 miles beyond this bridge. By the end of July, concrete abutments for the main bridge over the King River were in progress and girders had been delivered to the site. This bridge was to be the most impressive on the railway and, with a main span of 160 ft, would be the longest single span in the colony. Mr M Radcliffe, a Melbourne mechanical engineer for the builders, Dorman Long, arrived to supervise the construction. Traffic was suspended for two weeks to allow positioning of the main span, and the bridge was

completed in October/November 1900.

Platelaying had reached Linda Creek by the end of June 1900 and excellent ballast was being utilised from a source located at the 15 mile (24 km). A construction train was now leaving Kelly Basin twice daily, with enough material to lay 20 chains, thus giving a track laying average of a quarter of a mile daily. Another train was engaged in ballasting work. August saw completion of the tracklaying to Linda.

Work was also progressing in other areas. In November 1899, a contract had been let for construction of an engine shed at Kelly Basin and this was completed in May 1900. In July of the same year, a start was made on the construction of an ore shed and crusher on the wharf and this was brought into operation in September 1900. The return empty ballast train was now utilised to bring down ore from Linda, at first only intermittently, but from November, this was being done daily. The ore was crushed then bagged for shipment by sea.

Opening

Baxter & Sadler officially handed over the line to the company in December 1900, although there had been a trial run in November. Government inspection of the line took place in Tuesday, 1 December 1900, when a special train was used to convey the official party over the railway. The party included a Government Inspector, Mr WP Hales, Mr JP Madden, a company director, Mr E Longergan, Capt Anderson, several other company officials and Mr A Baxter of the contractors. The tests were satisfactory and approval was given for the railway to open for traffic. This was to take place on 17 December 1900.

Provision had been made for a branch line to Gormanston and, although it was not covered by the original contract, it seems likely that Baxter & Sadler also undertook its construction. The branch was given approval by the Public Works Department in August 1900 and construction commenced

The King River bridge in the 1970s. Photo: courtesy Frank Stamford

NML Railway locomotive No. 1, **James Crotty,** prepares a train at Kelly Basin.
Photo, J. Buckland collⁿ ex. J. Shennan

immediately. It was estimated that the line would be completed in three months, and the official opening of the main line was delayed pending its completion. In the event, construction proved more difficult than anticipated and warranted the use of continuous 1 in 30 grades and sharp curves, added to which was the delay in obtaining the rails. It was not until 7 October 1901 that the first train arrived at Gormanston, nearly 12 months after the opening of the main line, which in the end had gone ahead despite delays in building the branch.

Acrimony

Initially, everything seemed to be in order following the opening of the railway. However, in the cold hard light of day, some startling facts began to emerge which showed that everything was not as it seemed. It was claimed that the contract for construction was let to Baxter & Sadler without competition, and the final cost of £316 638, or some £10 000 per mile, had far exceeded the original estimate and made the line one of the most expensive on the west coast. The branch to Gormanston, which was all that eventuated from the wild idea that the railway would link all the mines on the field, was claimed to have been constructed to provide work for a favoured firm of contractors. Apparently this contract was also let without competition and had cost nearly £26 000, the funds for which had been borrowed from a London director at an interest rate of 10% per annum. There were also claims that the terminus was near a public house of one of the Melbourne directors, but nearly half a mile from Linda.

Added to all this was the time it took to build the railway. Originally estimated to take 12 months, the line had taken two years to build. It was reported that climatic conditions on the west coast were vastly different from those elsewhere in Australia and difficulties in getting ahead with construction were neither few nor small. Two-thirds of the entire work was in the earthworks of the first 10 miles from Kelly Basin, through heavily timbered country, so progress on the remaining portion of the line was hardly possible until this had been completed. Cuttings on this section were numerous and heavy, and the frequent filling in of these by landslips had been the chief cause of the delay.

Nothing is more certain than that the difficulties of construction were only recognised after work had commenced and the treacherous nature of the

country was disclosed. Rainfall in the area was over 100 inches (2540 mm), falling on over 200 days a year. While the delay in construction was embarrassing, it presented a minor advantage in extending the work over two rainy seasons. This was recognised as an insurance against costly maintenance and interrupted traffic when the line opened, as railway management was then fully aware of where difficulties may arise and could take the necessary remedial action.

Problems also arose in another area. The Mt Lyell Company, now suffering a loss of traffic since the opening of the North Lyell railway, strongly questioned the legality of the line under the terms of its Act of Parliament. The Government was not impressed either and the company was called to order over the matter. North Mt Lyell pleaded total ignorance. The matter was resolved by the passing of 'The North Mount Lyell Mining and Railway Act of 1901' on 30 December. Nevertheless, the North Lyell company continued to be a problem to the government, as they failed to comply with certain terms of the Act. The matter was finally resolved when the manager was dismissed and the Managing Director, who had recently arrived on the scene, stepped in to provide the required information.

The North Mt Lyell Company, having far exceeded their cost estimates with the construction of the main line, were no doubt reluctant to build any further lines. Those that were constructed were, in effect, only a completion of the overall project.

Mine Access

Prior to construction of the railway, the North Lyell company had been forced to mine its richest ore in order to maintain financial liquidity. This was bagged and shipped out via Queenstown, mainly to overseas destinations for smelting. Initially the ore was carted from the mine to the top of the Mt Lyell haulage by bullock drays along a road of doubtful quality.

As conditions on the road worsened, the company looked for an alternative. An approach to the Lyell Tharsis company to use their ropeway down into the Queen River valley was unsuccessful. The only alternative was to build a tramway from the North Lyell mine to the Mt Lyell haulage. A survey was undertaken in July 1899 and construction of the 2ft (610 mm) gauge line commenced by September the same year. Following delays for a variety of reasons, one being the shortage of materials, the tramway was completed in March 1900.

It was soon realised that the horse power used was unsatisfactory and it was decided to introduce a locomotive. This required relaying the tramway with heavier rails. Relaying work commenced in April 1900 and was completed the following month.

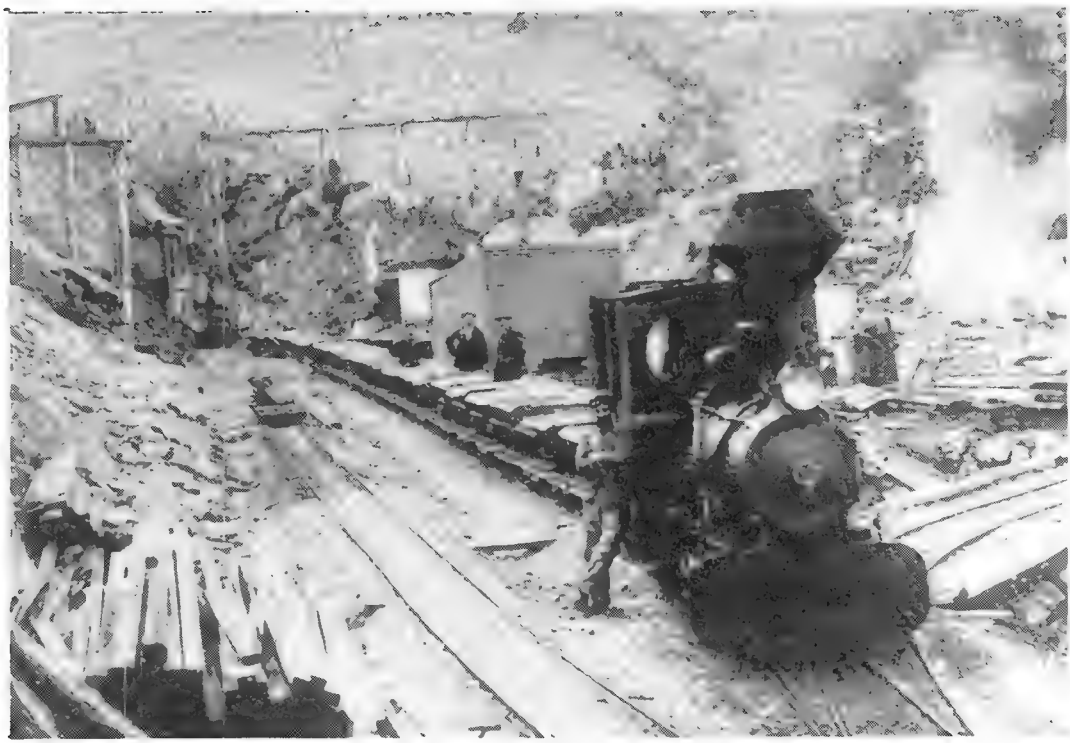
The failure of the North Lyell railway to reach the North Lyell mine was an embarrassment to the directors. To overcome the problem, they spent an extravagant £10 000 on the building of an aerial ropeway to connect the mine and railway. Earthworks for the mile long ropeway commenced in January 1900 and material began to arrive the following month. The ropeway was built by White & Company of Glasgow and construction was supervised by Henderson Brothers. The main rope was in position by the end of June 1900 and work was completed in August. Yet again the company blundered! The top of the ropeway was some half a mile from the mine itself, requiring adjustment to the 2ft gauge tramway from the mine to reach the upper ore bins and the lower end stopped short of the railway station at Linda, requiring cartage by horse and dray over the short distance to the railway. As if this costly transhipment wasn't enough, it was discovered that the buckets on the ropeway were of insufficient capacity to carry anything other than ore. The timber and machinery consigned to the mine had to be carted all the way from the station to the mine by horse and dray.

Some minor extensions were made to the 2ft gauge tramway. A short branch was laid from the main tramway to the ore bins at the top of the aerial ropeway and there were additional lines laid in the mine area itself, including one to the No.2 bench.

Two firewood tramways were also constructed from the North Lyell railway to 2ft gauge. The first of these was at Bird River and the other at Crotty. Very few details of these appear to have survived and it is difficult to determine when they were built and how long they were. No doubt the Bird River tramway was extended as cutting of the timber proceeded. The tramway at Crotty is credited by some sources as extending for a distance of 1½ miles, which would have taken it around the northern slope of the East Jukes Spur towards the King River gorge between Mt Jukes and Mt Huxley.

Lyell-Comstock Line

The first additional railway construction involved an associated company, the Lyell Comstock Consolidated Copper Company Ltd, also London-based. This company had agreed to send its ore to the proposed North Lyell smelter. With the hurried abandonment of the North Mt Lyell railway at Gormanston, instead of proceeding right up to the main mining area, the Comstock company had a problem. The obvious solution was for the company



North Mt Lyell 2ft gauge Krauss locomotive with ore trucks Photo: Winter's Studio, Burnie

to build its own railway to link up with the North Lyell line.

In January 1900, the Lyell Comstock company undertook a survey of a tramway from its mine on the north-western slope of Mt Lyell to Linda, but this had to be abandoned as the proposed line would have crossed the leases of two companies affiliated with the Mt Lyell Company. A second survey was undertaken in December 1900, this time following the difficult terrain around the northern and eastern slopes of Mt Lyell to reach Linda. It was planned that the line would have the narrower 2 ft gauge. Despite the proven ability of this gauge to transverse rugged terrain, the then manager foresaw difficulties with transhipments from one gauge to another, and in the end it was decided to use the 3 ft 6 in (1067 mm) gauge.

The North Mt Lyell company agreed to build and operate the line. To this end, the Lyell Comstock company advanced £10 000 to North Lyell, this amount presumably being sufficient to get things started.

Construction commenced in 1901. The line would make a trailing connection with the main line, half a mile from Linda station, and then follow the southern and eastern slopes of Mt Lyell to reach the Sedgwick Valley. It then followed the northern slope of the mountain to the mine site. Construction proved to be a difficult engineering task. On the northern face of the mountain, construction crews had to blast a narrow ledge along a sheer precipice of rock which overlooked the button grass flats along the King River hundreds of feet below. By mid-January 1902, some one hundred of men were employed on the project and work was sufficiently complete for platelaying to commence at the end of the month. Construction proceded slowly, however, as once again it was realised that the job was not as easy as originally thought.

Construction continued for some time before the sudden cessation of smelting at Crotty in May 1903 forced the North Lyell and Comstock companies to abandon the project within sight of its goal. The contractors had completed some 6 miles 70c (10 km) of the formation from Linda to the base of the Comstock lease and laid about 3½ miles (5.6 km)

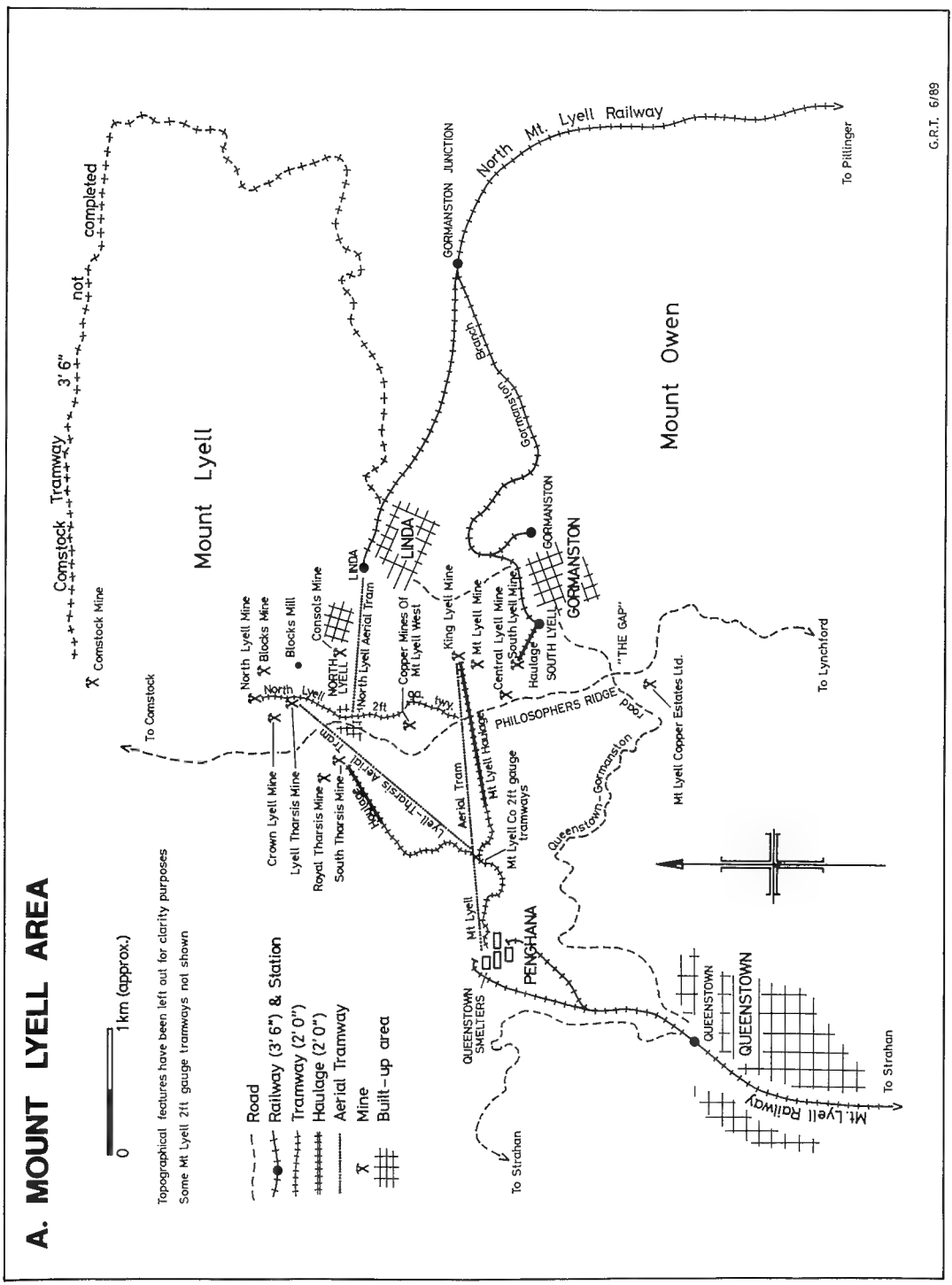
Ropeway to North Lyell mine in 1915. Photo: H.J. King

of track. A total of £16,722 had been expended on the project. Abandonment of the project probably proved a wise move, as it was later found that the ore of the Comstock mine was only half as rich as expected and was certainly not, at that stage, worth mining. Added to this was the obvious difficulty in working a line which abounded in unrealstically sharp curves and a maximum gradient of 1 in 16! If this was not enough, construction of the line had been very poor, leading to frequent derailments of the construction locomotive.

Both companies decided to cut their losses and settlement was reached in May 1903, whereby the North Lyell company agreed to accept half the balance still owing on the cost of construction. This additional expenditure of £3361 did not help the North Lyell finances at all.

Following the 1903 merger, the new company contemplated converting the partially completed line to 2ft gauge, in order to transport Comstock ore to Queenstown via Linda and the Mt Lyell haulage. This did not eventuate and the rails were lifted. The abandoned formation remained as a stark reminder of a foolish enterprise.

In 1912, after the Mt Lyell company had purchased the Comstock mine, a 2ft gauge tramway was built to the mine from Queenstown, following the west and north route around Mt Lyell via the Queen River valley.


A. MOUNT LYELL AREA
0
1 km (approx.)
Topographical features have been left out for clarity purposes
Some Mt Lyell 2ft gauge tramways not shown
Road
Railway (3' 6") & Station
Tramway (2' 0")
Haulage (2' 0")
Aerial Tramway
Mine
Built-up area
Comstock Tramway 3' 6" not completed
Comstock Mine
To Comstock
Mount Lyell
North Lyell Mine
Blocks Mine
Blocks Mill
Consols Mine
Crown Lyell Mine
Lyell Tharsis Mine
Royal Tharsis Mine
South Tharsis Mine
Lyell-Tharsis Aerial Tram
Haulage
NORTH LYELL
North Lyell Aerial Tram
LINDA
Copper Mines Of Mt Lyell West
King Lyell Mine
Mt Lyell Mine
Central Lyell Mine
South Lyell Mine
Haulage
SOUTH LYELL
GORMANSTON
GORMANSTON JUNCTION
Gormanston Branch
North Mt. Lyell Railway
To Pillinger
Mount Owen
"THE GAP"
PHILOSOPHERS RIDGE
Road
Queenstown-Gormanston
Mt Lyell Copper Estates Ltd.
To Lynchford
Mt Lyell Aerial Tram
Mt Lyell Haulage
Mt Lyell Co 2ft gauge tramways
Mt Lyell
QUEENSTOWN SMELTERS
PENGHANA
To Strahan
QUEENSTOWN
QUEENSTOWN
Mt. Lyell Railway
To Strahan
G.R.T. 6/89

Crotty Branch

The next line to be built turned out to be an unplanned necessity. The North Lyell smelters were originally planned for a site near the railway bridge across the King River. This was abandoned in favour of a more suitable position high on a plateau on the eastern slopes of Mt Jukes. This location meant that the already constructed main line was lower in elevation and half a mile east of the site. To gain rail access, it was necessary to construct a branch and, to maintain a suitable grade, the junction was about 2 miles from the smelter. Construction started early in 1901 and was completed for the start of the smelter building in May 1901. A township quickly grew up below the smelters, which was named Crotty in honour of the company's founder. It was served by a station of the same name on the main line.

In addition, a short branch, only 45 chains (900m) long, was built from the main line at Darwin to quarries west of the town where limestone was extracted for use in the smelters. It opened in October 1901.

South Lyell Branch

The North Lyell company applied to build a branch from Gormanston to the South Lyell mine in April 1900. Just where this line was planned to go is not reported, but, as the mine was at a much higher level than the Gormanston terminus, it is likely that high construction costs prevented its implementation at that time.

The South Lyell mine came into prominence again in the latter half of 1902, when it was decided to use copper pyrite from there in the smelting process at Crotty. The mine was pumped dry and, in October 1902, navvies built a short half-mile branch from a point just before the Gormanston station. It curved round to the west to storage bins served by a self-acting incline up to the mine. This short extension was the last railway construction undertaken by the North Lyell company.

Construction Locomotives

Baxter and Sadler used three locomotives on the North Mt Lyell railway construction contract. They had previously used all three on railway construction work in Western Australia.

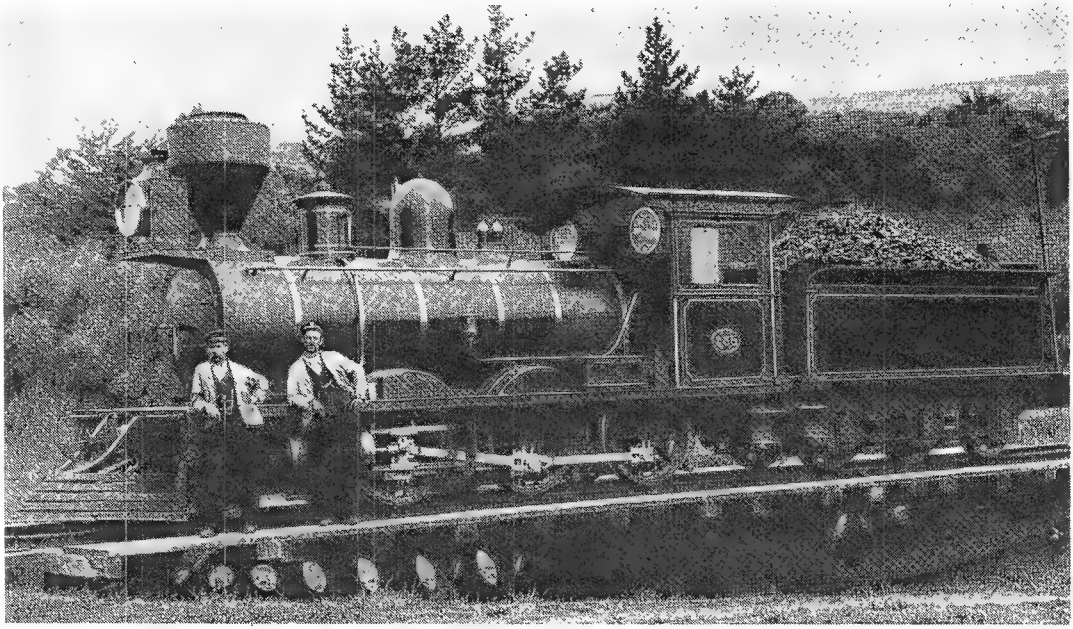
The first of these was an 0-6-0ST named *TOM CUE*, which had been built by Hudswell Clarke in 1891 (B/No. 378). It was part of an order of six locomotives for the contractor Edward Keane for use on construction of the Midland Railway. In 1895, Keane sold the locomotive to Baxter & Price for their Geraldton-Murcheson railway contract for the Western Australian Government Railways (WAGR). Baxter retained the locomotive and used it in conjunction with Sadler on the WAGR Mullewa-Cue branch construction. It would appear that the name *TOM CUE* was applied during one of these contracts.

TOM CUE arrived at Kelly Basin on board the ss *Orowaitti* on 30 December 1898. As no wharf facilities had been completed at this time, the task of unloading the locomotive must have been difficult and it was not re-erected and ready for service until February 1899. It led a fairly uneventful life, apart from an accident in June 1899 which was apparently of sufficient severity to warrant reporting.

Early in 1900 Baxter & Sadler employed a Victorian Railways fitter, Harry Maddox, to undertake a full overhaul of the locomotive. This involved sending the boiler to Melbourne for repairs. *TOM CUE* returned to service in June. On completion of the contract in November 1900, the locomotive was shipped to Melbourne. It was sold to David Sanderson in 1901, for use on is Noonday Creek tramway near Forrest. Sanderson & Grant's tramway, as it became known, was destroyed by floods in 1923 and *TOM CUE* was dumped in the forest, where it stayed, gradually deteriorating, until its remains were scrapped some time after World War II.

In 1896 Baxter & Sadler imported two larger 2-6-0 tender locomotives for their Mullewa-Cue railway construction contract in Western Australia. They were built by Dubs & Company and carried the numbers 1 and 2. According to builder's records, these locomotives were identical to the New Zealand Railways J-class (built between 1874 and 1883). However, photos of the locomotives in Australia show there were detail differences (eg, the safety valves). At some stage in Western Australia they received the names *YALGOO* and *MURCHISON* and these were on the locomotives when they arrived in Tasmania. Boiler records for the latter state confirm the names, but also credit *MURCHISON* with the number 13.

Both locomotives arrived at Kelly Basin on the ss *Orowaitti* on 16 January 1899. They were unloaded on the new wharf and, after reerection there, were hauled around to the new engine shed, built by Baxter & Sadler, by *TOM CUE* on 28 May. Both locomotives went into service on construction trains soon after and, by June, *YALGOO* was used for ballasting, while *MURCHISON* was handling the twice daily construction trains. At the conclusion of the contract in late 1900, both locomotives were stored, or possibly were used on construction of



New Zealand Railways J-class 2-6-0 No.259 at Mercer c.1896. Baxter & Sadler's *YAGLOO* and *MURCHISON*, build by Dubs & Co in 1896, were of very similar design.
WW Stewart collection, NZ Rly & Locomotive Society

some of the branch lines.

YALGOO was inspected by the boiler inspector at Kelly Basin in April or May 1912 and then sent to Melbourne. It went to work for Smith & Timms on the construction of the Yeelanna-Murat Bay (now Ceduna) railway on the Eyre Peninsula, South Australia. It was sold to the Commonwealth Railways in 1916 for use on the North Australia Railway and, about 1917, became their Nfa-class No.8. It was withdrawn in 1928 and lay derelict at Parap Workshops, Darwin until scrapped in 1944.

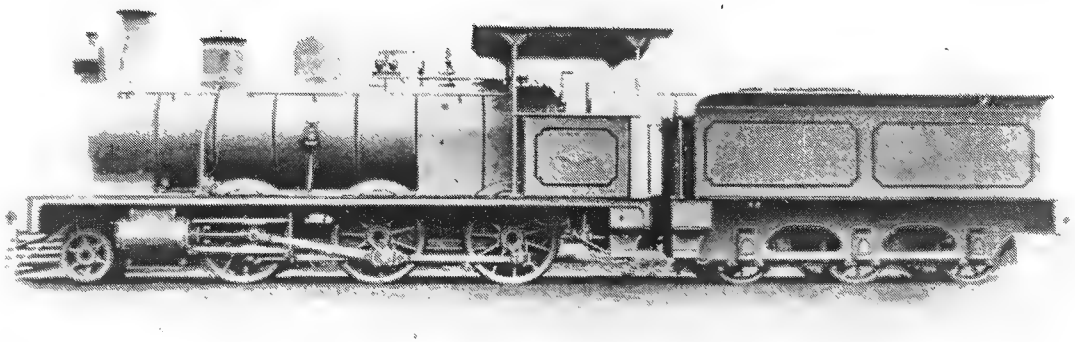
MURCHISON was also sold to the mainland and shipped to Melbourne in 1901, probably at the same time as *TOM CUE*. Its next recorded appearance was with the Mount Molloy Copper Company in north Queensland. This company built their own 20-mile railway north from Biboora, where connection was made with the Queensland Railways, to their smelter at Mount Molloy between mid-1907 and September 1908. The date of arrival in Queensland has not so far been found, but the Mt Molloy Copper Company was strongly pressing the Government railways for the purchase, hire or loan of a locomotive in July 1907. As this was not agreed to, it seems likely that *MURCHISON* arrived about this time. The locomotive was overhauled in 1910, but by the time the Government railways inspected the line in early 1917 prior to their takeover, it was noted laid up for some time with a condemned boiler. It is probable that it was scrapped soon after, as it was not taken into the Government railways stock.

Contractors Wagons

Baxter & Sadler undoubtedly employed the usual motley collection of wagons that one associates with railway construction projects. They probably brought most or all of the wagons used on the project from Western Australia with the locomotives.

Using other railway construction contracts as a guide, one can surmise that the wagons were probably all four-wheel open and flat wagons of varying sizes obtained from a variety of sources. There is a newspaper report for May 1899 mentioning the use of hopper wagons for ballasting, at least a month prior to the arrival of the newly-built company-owned hopper wagons. One can wonder whether this was fact or just ill-informed journalism.

Six contractors wagons were taken into the North Lyell railway stock in late-1902 or early-1903. A



Dubs & Co builders photo of 2-6-0 locomotive (B/N 3385-6 of 1896) for Baxter & Sadler construction work in Western Australia and transferred to North Mt Lyell in 1899.

J.L. Buckland Collection

photo exists of one of these, bearing the number F 1, and shows a long wheelbase 4-wheel two-plank open wagon, suggesting that they were classified F-class Nos 1-6. It is interesting to note that an extension had been added under the main frame of the wagon to raise its coupling height to that of the main North Lyell stock. The axle-box cover on this wagon reads SAR — J MARTIN — GAWLER.

These wagons were listed in a 1903 report on the railway as being contractors' ballast wagons with a capacity of 6-tons and the likely use of them was on permanent way maintenance. Disposition of the wagons after 1903 is not known. One may have had a long life, as a similar wagon existed at Kelly Basin in 1964, but had disappeared by 1972. Its axle-boxes presented an interesting collection. As far as could be deciphered, the first read MIDLAND RAILWAY OF W.A., another JAMES MARTIN — GAWLER — 1888, and a third JAMES MARTIN — GAWLER — 1889.

References

The article as been prepared from an extensive search of early newspapers, reports, articles and books. A full list will be published at the conclusion of the series. Key documents are:

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2. Mt Lyell Mining & Railway Company, records held in the Tasmania State Archives, Hobart.
3. Tasmanian Public Works Department, records held in the Tasmania State Archives, Hobart.
4. Union Steam Ship Company of New Zealand, records held by the company.
5. *Mt Lyell Standard* newspaper.
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9. Lou Rae, *A History of railways and tramways on Tasmania's West Coast,* published by the author, 1983.
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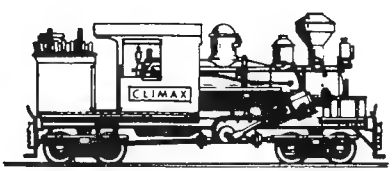


EARLY AUSTRALIAN ELECTRIC LOCOMOTIVES

PART 4: CORNWALL COAL MINE, TASMANIA

In 1906 the Cornwall coal mine introduced an electric locomotive for underground haulage. Kieth McDonald's records indicate that this was General Electric (USA) builders number 2376/1906, a 4-wheel electric of 1 ft 11½ in in gauge. It has been preserved at the West Coast Pioneers Memorial Museum, Zeehan. The following description of the mine and operations comes from the *Australian Mining Standard and Electrical Record* of 5 May 1909, submitted by Norm Houghton.

Within some two miles of the railway terminus of St Mary's, a village situated at the head of the famous St Mary's Pass, travellers by train to the East Coast of Tasmania may notice the buildings and surface works of the Cornwall Coal Mine, on the northern side of the route, 500 ft above the fertile plain which the railway traverses. The side of the hill is here pierced by several adit levels, one of which forms the main heading, extending some 50 chains from the mouth of adit to the working face, and rising gently all the way. The mine is worked on the "pillar and bord" system. Outside the mine the road, as now reconstructed, rises for 18 chains, with a gradient of 1½ per cent (the heaviest grade against the load), and thence falls slightly to the top of a "bank", some 25 chains from the mouth of the tunnel. Here is fixed the upper terminal of a self-acting tramway, down which the full skips descend by their own weight to the screens, situated just over the level of a Government railway siding, and in their descent draw up a set of empty skips by means of a wire rope passing round a brake wheel at the top of the bank.

Previously the skips were drawn by horses to a "plat" some 8 chains within the mine, thence by a wire rope main-and-tail haulage plant, driven by a steam winding engine to the gravitation tramway on the bank top. The annual maintenance of the rope haulage plant entailed considerable expense, and as the main heading is continually being driven further into the mine, it became a moot point when additional expenditure was necessary for extensions, whether to extend the rope haulage system or to provide, and, more expensive, to maintain, additional horses, or to replace both by some other means of haulage.

At this juncture the directors of the company sought outside advice, which reported strongly in favour of electrical haulage. Tenders having been invited and received, the contract for a steam generating set, switchboard, locomotive, track and trolley material was awarded to the Australian General Electric Co, whilst an order was lodged with Salisbury's Foundry Co, of Launceston, for a horizontal multitubular boiler, to work at 130 lb steam pressure.

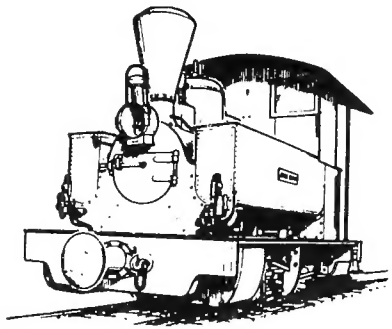
The generating set comprises an engine by Robey and Co, of Lincoln, open vertical type, with one double acting cylinder 9½ in diameter, by 9 in stroke, 300 rpm, fitted with a sensitive shaft governor, which controls the speed by varying the cut-off; and a belt-driven 6-pole compound generator, running at 1200 rpm, of 25 kw rated capacity, but capable of carrying a 20 per cent overload. The degree of compounding affords a rise of voltage from 250 at no load to 285 at full load.

The switchboard is of blue Vermont marble, and on it are mounted an automatic overload switch, adjustable for any predetermined overload, a voltmeter and ammeter of the Thomson astatic type, both of which are practically dead beat, and a multipoint switch directly connected with the usual shunt resistance, which is mounted behind the board.

The current is led direct from the switchboard to the trolley wire, which is of No OB and S gauge, no feeders being at present necessary, on account of the comparative shortness of the line, and the fact that the heaviest gradient and curves are close to the generator. Mining suspensions, with 9 in plain ears, are employed. The rails are bonded throughout with OB and S copper bonds, having solid terminals, which are passed through holes drilled in the web of the rail, and then compressed by a special bond compressor.

The locomotive, which weighs about 3 tons, and is constructed with heavy cast-iron frame, and provided with two motors (rated at 13 bhp each, on the basis of 75°C rise of temperature for one hour's run), series-parallel controller, efficient brake, sand-boxes, powerful headlights, and a removeable swivel trolley, which can be placed at either end of the locomotive.

The rated draw bar pull is 700 lb. The operating handles are all conveniently placed. In the photograph the motor man has his left hand on the controller, his right on the brake. The sand-box levers and gongs are close to the left hand, and the main switch and head lamp switch are near the brake handle. All the gear is kept low, the total height of frame being only 2ft 3in above the rails, so that it is unnecessary to "brush" the roof to afford room for the locomotive. The ordinary set consists of from 15 to 17 skips, and weigh about 11 tons. The locomotive makes the double trip from bank top to working face and back in about 20 minutes.

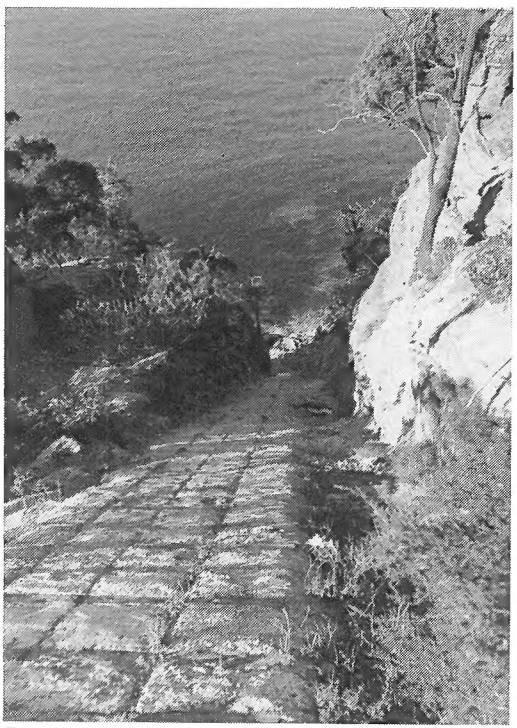


LETTERS

WEST HEAD HAULAGE, BROKEN BAY, NSW

During 1946-47 I spent a period in Sydney and visited West Head, Broken Bay. Here I photographed the remains of a steep haulage which served the site of a gun emplacement during the War. A photograph is the haulage formation is enclosed, which may be of interest to readers. Can anyone provide further details of this operation?

JL Buckland
East Brighton, Vic



Remains of the steep haulage at West Head, Broken Bay in 1946-47.

JL Buckland

RAILWAYS OF PAPUA NEW GUINEA: LR.97, 101

I have recently had the opportunity to visit and inspect a tramway here in the East Sepik Province which was not mentioned in Michael Person's extensive "Chronicle" of PNG Railways and tramways. This is the 700 mm gauge timber tramway at Marienberg Mission on the Sepik River.

The mission was established by the Divine Word Mission in 1913. The tramway and sawmill was established after WWI, probably in the 1920's, when the mission became an important source of sawn timber for other stations on the Sepik River system. Local villagers report that the line ran a fair distance — at least 6 km — to timber stands and that it was worked by buffalo. Japanese troops occupied the site during WWII, when the buffalo were killed.

After WWII, the mission reestablished their sawmill on a larger scale, together with an associated furniture factory, but utilising logs floated down the river. During the 1960's the enterprise was a busy affair with over 200 people employed, but enthusiasm waned with the departure of lay missionaries, and activities were wound down in the 1970's. The mill closed in 1974.

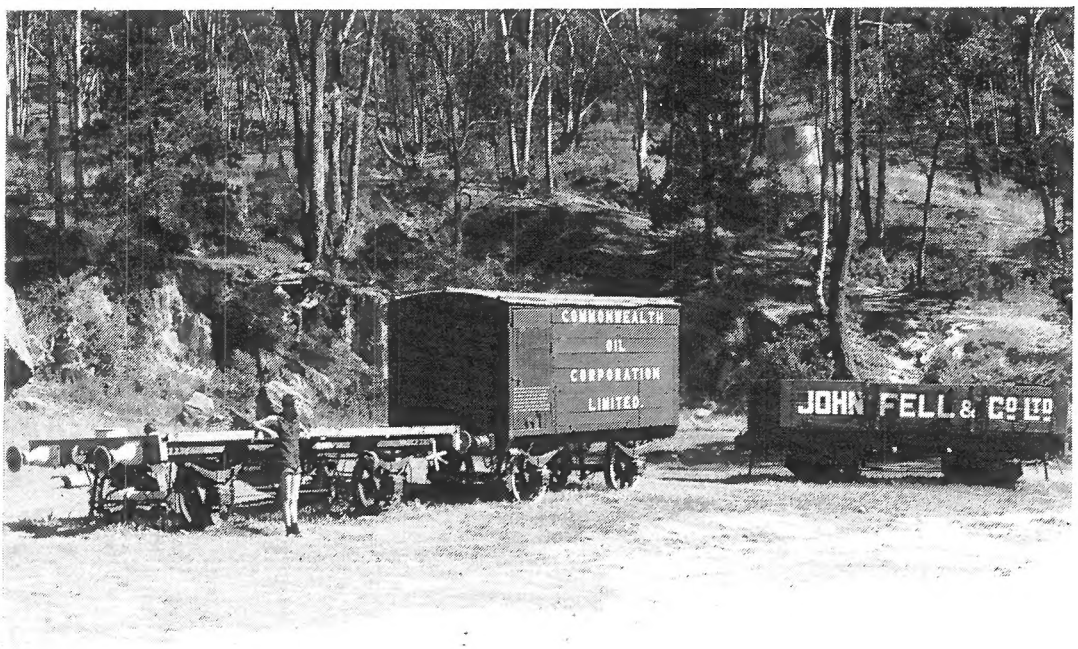
Today a network of about 500 metres of 700 mm track remains in place around the mill yard and a 4-wheel hand truck still sits on the line. Other rolling stock has gone to nearby properties. The mill was steampowered for a brief period and a large boiler remains near the mill.

Bob McKillop
Wewak, PNG

WOLGAN VALLEY RAILWAY SOCIETY, NEWNES, NSW

Readers may be interested to hear of the Wolgan Valley Railway Society, which was formed in 1987 to establish a static display of rolling stock and other items associated with the oil-shale industry in general and Newnes in particular. The long-term objective is an operating railway on part of the Wolgan Valley railway. Presently we have an unmanned, open access, static display at Newnes. Two goods vehicles, a van and "B" wagon, lettered with company names, are on display at Newnes. A third vehicle is presently being rebuilt to resemble a Newnes "D" wagon.

Alan Watson



A small collection of Wolgan Valley Railway Society rolling stock at Newnes in October 1986.

JL Buckland

Back Cover: T Purcell & Coy advertisement for *Caldwell Vale* petrol locomotive.